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PHYSIOGRAPHY AS A FACTOR IN COMMUNITY LIFE

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IN a subject so much discussed as the relation between geography and history has been, it is very easy to go too far in ascribing to one factor only in man's life on the globe, those complex results which are the effect of the operation of many. At the same time it is apparent to all that physiography has played an important rôle in every community, large or small, in the world's history. We are so much accustomed to take this for granted that we speak of the Nile-created civilization of Egypt, the brick-making founders of the great Babylonian dynasties, the tiny mountain-locked city-states of the narrow Greek world, without supplying either explanation or argument. It is Mommsen, I believe, who has given us that unrivalled description of the differences between the sea-roving, land-hating Phœnicians and their Carthaginian descendants, whose unbounded political ambitions, the outgrowth of their different physiography, found perfect expression in the career of the Barca family and well-nigh compassed by the hoped-for destruction of Rome a total alteration in the course of Ancient History. While Ratzel in his Soil and the People takes extreme ground where he says: "The soil assigns cruelly and mechanically historic destinies. In this power of the soil which operates profoundly and which accentuates itself through all the vicissitudes of history and throughout the whole range of human life, there is something mysterious which seems to act like a fatality, annihilating man's apparent freedom of action."

American history is full of examples of the importance of physiographic environment. It was not wholly the differences in education and religion that led to the striking contrast between the two groups of colonial Englishmen in Virginia and New England. Here was imperial Virginia from among whose citizens was chosen the Commander-in-Chief in the Revolu-

tionary War, the author of the Declaration of Independence, our greatest chief justice of the Federal Supreme Court and all the Presidents but one down to 1825. On the other hand, provincial New England gave the new-born nation an object lesson in Whig anarchy in Shays' Rebellion, furnished the only state of the thirteen that persistently refused to enter the Union and in the War of 1812 stood openly opposed to the Federal Government and in ambiguous association with Great Britain. Surely something more potent than bygone church or party affiliation made the descendants of the 30,000 English immigrants into Virginia play the leading rôle in colonial and national life for the first half century of our independent existence, and New England Puritanism *per se* can hardly explain the dearth of national leaders displayed by this section nor account for the lamentable shortsightedness of the advocates of the Alien and Sedition Laws and the promoters of the Hartford Convention. The commanding position of Virginia in our history appears more explicable, however, if we take into account her unrivalled location which gave into her keeping the most dangerous Indian border in America and cultivated in her people that feeling of responsibility for the great undeveloped west until they attained the clearest conception of our unique national destiny. On the other hand New England was a small, compact, and comparatively poor region with no great west on her frontier and therefore the first to reach industrial maturity. Her Indian troubles came to an end nearly a hundred years before those of Virginia. Most significant of all, perhaps, all migrations of her young people, instead of building up some of her western territory, as in the case of Virginia, went to develop and strengthen a neighboring and rival state. Thus was produced in the course of a single generation, or a little more, that ultra conservatism which flowered into that remarkable product, New England Federalism.

But we can not understand even the fundamental elements in New England Federalism unless we take into account the geographical distribution of that party. "In 1800, the Federal party," says Henry Adams, "included nearly every one in the professional and mercantile classes and represented the wealth, social position and education of the Commonwealth." That this is a misstatement can be seen from the fact that the eastern third of the State of Massachusetts went Republican in 1800 and in 1804 while the Federal party for those years was strongest in those parts of the state which had furnished the largest quota of Shays' rebels and paper money men in 1786 and had sent a solid delegation of Anti-Federalists to the state convention in 1788. In this connection it may be well to correct another very popular misapprehension regarding the atti-

tude of Massachusetts during the War of 1812. The Republican party carried the eastern third of the state in the elections of 1808 and 1812 while the opposition came from the same rock-ribbed Federal districts that have been referred to, in the central part of the state, whither it is certain not all the mercantile and professional classes had migrated, carrying along with them the "wealth, social position and education of the Commonwealth."

One further point in our comparison between Virginia, the champion of national development, as against conservative New England. Thomas Jefferson of Virginia organized and led to victory the first national party representing American democracy in our history, and as head of this party he added that magnificent domain west of the Mississippi River, and in both of these truly great tasks he was bitterly opposed by the Federalists of New England, which section had been circumscribed and hampered by her physiography in the same degree that Virginia had been stimulated and developed by hers.

These are facts with which all are doubtless very familiar, and a restatement of them is permissable only as furnishing a background for some illustrations of the subject more local and sectional in their nature.

The new State of North Dakota, admitted in 1889, affords the historian an excellent field for the elaboration of the thesis which stands as the subject of this paper. Ethnologists tell us that the Siouan group of the American Indians once lived on the Atlantic Ocean and, coming in contact with the great herds of buffalo that about the year 1000 had reached far east of the Mississippi River, they migrated northwestward to fill the plains of the trans-Mississippi region with the most powerful and best organized stock in America. North Dakota received its Siouan population of buffalo-hunting nomads from this great movement. The physiographic feature to which she owed this occupation of her soil is the valley of the Missouri River, a unique region having a higher average temperature in winter than the adjoining section, and offering to deer, elk, buffalo, and antelope a winter protection in its well-timbered coulees and valleys, and in its Bad Lands formation. Throughout its length run countless Indian trails and on the higher buttes and in the sheltered spots are summer and winter lookouts and camps and permanent village sites. Prominent among the representatives of the Siouan stock stand the Mandans, who have been visited and described by Lewis and Clark, Catlin and Maximilian. These Indians were in all respects the most highly civilized of any in the Northwest. They were sedentary in habit in contrast with their nomadic neighbors; their houses were of heavy frame with earth

covering; they had a well-developed social, religious and industrial life; they raised regular crops of tobacco and corn, and this last, with the wild turnip and several sorts of fruit, supplemented their supply of buffalo and other meat. In this rich valley were perfected two arts peculiar to the Mandans,—the making of colored glass ornaments and the manufacture from the local clay deposits of an artistic and very durable pottery, which had progressed to the initial stage of glazing. In variety of pattern and skill of execution this pottery has no equal outside the region of the southwestern Indians. So perfectly adapted was this civilization to the physiographic conditions, including the fauna and flora, that had their tribal strength not been reduced by a series of attacks of smallpox, culminating in 1837, it would still be possible to trace their history back to their first migration from their ocean home with the various stages of progress clearly enough marked for scientific study. As it is, their mythology, their social regulations, their secret societies, their police, their provisions for sanitation, charity, education, and the like, present very tempting fields of study. Closely associated with this central culture group were a northern tribe, the Grosventre or Hidatsa, at present inseparably connected with them, a southern tribe migrating from the south and southwest, the Arikara (Pawnee) while on every side, mostly at war with them, roamed the nomadic Sioux, whose persistent attacks drove the Mandans as far north as the Knife River, where they found the Lewis and Clark expedition in 1804.

But the physiography of this state was responsible for decadence as well as progress in the life of its savage inhabitants. On the northern boundary in the valley of the Souris or Mouse River, lie the Turtle Mountains, a hilly, well-wooded plateau, full of glacial lakes and affording an excellent wintering place for big game, especially the buffalo, and besides this it was an unsurpassed trapping ground. The Chippewa or Ojibway tribe of the Great Lakes had from early times been extending their territories westward at the expense of the Sioux. After getting control of the upper Red River Valley, they were able, last of all, to win, and hold permanently, as their advance position, the Turtle Mountain plateau. Here they paid the penalty of a new environment; they began to lose the lake and woods craft they possessed before coming to this plains region; the arts of canoe-building, pipe-manufacturing, cloth-weaving, basket-making, bead and silk work, were lost wholly or largely. Before coming to this state they had been hunters, needing a variety of weapons and much skill to secure all the sorts of game they lived upon. Now it was simpler; the buffalo supplied everything,—houses, clothing, food, weapons, and

tools. Their tree burials were changed to a modified form of earth burial, their games degenerated strikingly in the material from which the pieces were made and in the skill used in cutting or carving them. Their mythology, too, dwindled to a mere echo of the beautiful and rich lore of their brothers of the lakes and woods.

The method and character of the white occupation of this state was predetermined by the rather singular physiography of the region. The double-drainage system of the state, the Missouri and the Red, has already been indicated as bringing about the great clash of the plains and the woods tribes, the Sioux and the Chippewa. In somewhat the same way this state was the battle ground of rival fur companies, and contending nationalities. The Missouri River region was exploited by the Spanish and French traders from New Orleans or later St. Louis as their base. Good types of these men were Manuel Lisa, the famous Spanish trader, and the Choteau family, connected with the well-known American Fur Company.

The centers of the Red River trade for the period of French control to 1763 were Montreal and Quebec, and indeed long after this they were the seats of important companies like the Northwestern Fur Company and its predecessor the X. Y. Company. But after the founding of the Hudson Bay Company in 1670 and more especially after 1763, York factory on Hudson Bay and London, England, were the centers and English influences began to be felt in this valley. Down to 1820 the bitter war between rival companies for the Indian trade led, among other things, to Lord Selkirk's famous settlement in the region of what is now the city of Winnipeg and this settlement brought into the limits of our present state the first white settlers in its history.

The net results of these physiographic conditions and the consequent fur-trade occupation of the state were three: First, the presence of the all-important buffalo herd, which perpetuated the nomadic life of the plains, was fatal to the agricultural occupation of the state and long delayed the discovery and use of our rich valley lands. The ranch life of the early settlers, so inimical to the advance of agriculture into the region, is a later continuation of this aboriginal nomad existence. Second, the fur-trade importance of the Red River Valley led England to long retain possession of it and it lay on our northern frontier like a great wedge thrust deep into the Louisiana Purchase till 1818, and she did not really relinquish it until late in the last century. As a consequence, the influence of England on our northwest frontier was felt in the War of 1812 and did not entirely disappear until after the Sioux outbreak of 1862. The establish-

ment by the U. S. Government of the historic military ports at focal points along these two great waterways was the outcome of these conditions. Ft. Abercrombie, Ft. Ransom, Ft. Totten, and Ft. Pembina were made to guard the Red River Valley, while Forts Yates, Rice, Lincoln, Clark, Stevenson, Berthold, and Buford, served to render the Missouri Valley less unsafe for steamboat traffic and the passage to and fro of the Montana gold miners, and these forts became places of rendezvous where accurate information concerning the west was to be had, treaties were made, and Indian councils were held.

Third, this long and active occupation of our state by powerful Indian tribes and resident trading companies with their battalions of agents, trappers and hunters produced a half-breed population which is still to be reckoned with on our reservations and in many counties of the state and which in 1850 made up more than 90 per cent. of the names in our first Federal census, some 1100 in number. This mestizo population has knit us closely to Canada by the habit these half-breed hunters early developed of ignoring international boundary lines in their summer buffalo hunts east of the Missouri River and in their winter encampments in the valley of the Red River. This persistent ignoring of boundary lines in favor of larger physiographic bounds has continued down to the present time. The flat-boat trade from the timbered regions of the Red Lake River and the head water tributaries of the Red down to Ft. Garry or Winnipeg, continued in the winter by Red River carts and dog-sledges, developed later into the steamboat traffic of the 60's and early 70's until the coming of the railroads put an end to this phase of our industrial history. Now imported labor is rushed by rail far north into the valleys of the Saskatchewan to harvest the early-ripening crops there and this army of workers, half tramp and therefore half criminal, comes sweeping south as the frost line approaches and disappears in the lumber camps of Minnesota and Wisconsin or in some other less strenuous harbor of refuge nearer the equator.

From these various points of view, therefore, it is seen that the state has moved along lines laid down for it by its physiography and while it is true that one stage of development has been replaced by another and yet another, this has been accomplished by successive and successful victories over one feature of the physiography by means of another. Fur trade has given place to ranching, agricultural pursuits are now in the ascendancy and if we can solve the briquetting problem in the utilization of our unlimited supply of low-grade coals, the stage of centralized industries will speedily be attained. Above all, our future is linked inseparably with that of the Canadian provinces and peoples across the line.

HOW MUCH DO YOU KNOW ABOUT THE GEOGRAPHY OF THE UNITED STATES?

By FELIX J. KOCH
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IN the northwestern portion of the United States there is rapidly growing a movement which, for want of a better name, has styled itself the "See America First." Its purpose is stated by its name.

The result of the movement is making some of us discover that we do not know all of the interesting nooks and corners, peoples and customs of the republic, many of which we ought to know before crossing the seas to visit better-advertised, but no more interesting regions.

Below are given a few examples of little-known features, not always purely American, but sometimes as foreign as any European city.

1. Where can I visit a typical French town, in our own country?

Down in the Latin Quarter, so-called, of New Orleans. The buildings are for the most part four-story. The lower floor is given over to a store, and here the windows project out beyond the sill, while at their sides are heavy wooden or often iron shutters. On the second floor, or as they would say in France, the first, there is an iron balcony supported by slender pillars at the curb. Beneath it runs the broad flagstone walk, throwing the shop into shadow. Upon the balcony, or on the gallery above, there may be plants and benches. Usually there are the wash-props of the tenants as well. In this quarter men peddle roasted potatoes and roasted chestnuts as in France. The cafés have the real French customs.

2. Where can I visit a replica of "The Old Curiosity Shop" without going to England?

In this same French quarter of New Orleans. After the Civil War many southern families found their exchequers depleted and were forced to sell heirlooms and keepsakes. These were gathered from over the South by dealers, most of whom occupy one solid block in the Crescent City. One man here is world-famous, and such writers as Field and others have taken him as a prototype. His shop is even more interesting than the one of Dickens' book because of the greater variety and probable value of its contents. The history of rare specimens is ferreted out through biographical and genealogical dictionaries.

3. Where have we a people who, like the natives of southern-most Austria, have preserved intact their nationality and their customs, though a mere island in an ocean of other nationalities?

In the Louisiana cities, in the form of the Creoles. Although almost

as dark as negroes, the Creoles are of French or Spanish descent, or a mixture of the two. They are exceedingly clannish and do not intermarry with outsiders as a usual thing. In fact, so exclusive are they that they must know a person's entire ancestry before they will admit him or her to their society. They still speak French very largely among themselves.

4. Where might Napoleon have lived in this country had he not died just when he did?

In New Orleans. In 1821 a plot was formed whereby the swift ship "Seraphine" was fitted out with a band of cut-throats and adventurers, who were to rescue the Emperor from St. Helena and bring him to a house prepared for him in the Crescent City. On reaching the mouth of the Mississippi, however, news was brought by an incoming vessel of the Emperor's death, and the expedition was abandoned. The house still stands, and to-day its queer yellow-plastered exterior, with the little watch-tower, is the mecca for many tourists who have learned of the spot.

5. Just where was the formal delivery of Louisiana from France to the United States made, and when?

At the St. Louis World's Fair we were misled by a leading painting as to the date of this event. History sets it as December 20, 1803. The place was the Cabildo, still a show-place of New Orleans. In it the Spanish and the French governors of the territory had their seats, and here, at one time, or at its rear, was a prison. The stocks once used here are still to be seen, reminding one of the torture instruments exhibited in The Hague.

6. Have we any picturesque customs such as Europe abounds in?

At the Cathedral, at New Orleans, each evening at vespers the bells are tolled and masses said for the repose of the soul of the Don Almonastray Roxas, the donor to the colony of the church. In a certain church in Pennsylvania the custom remain of dropping each year a rose on the altar in memory of the founder. For many years fishermen from near Glouces-ter made an annual floral offering to the sea in memory of comrades who had died on the waters in the past year.

7. In Europe the marketplaces are always seats of interest to the traveler. Have we any to equal these?

The French market in New Orleans though smaller is probably even more unique than the great Halles Central of Paris because of the extreme neatness in its displays. Such things as soup-greens, for example, are tied into really ornamental bouquets. Vegetables, in baskets, are not simply heaped high; the upper ones are formed into a pyramid, ending in a single specimen.

The brass urns of the coffee sellers compare very favorably with those encountered in the capital of Roumania. The fruit stalls are almost replicas of the ones seen at Naples. In fact, the entire market is a unique display.

8. What can we show to compare in interest with the Grey Nunnery of Canada?

In the heart of Kentucky, Gethsemane, the Trappist monastery, made famous by James Lane Allen, is one of the most interesting spots in the world. The Trappists have many unique rites, not the least of them being the absence of spoken language except when there is the most *absolute* need of it; and also the fact that they employ no coffins, but are laid in the earth itself. Then, at New Orleans, there is a convent of negro nuns, the Sisters of the Holy Family, which usually excites interest. Near Philadelphia there is another Roman Catholic order of women whose rule is so strict as to excite the greatest interest. At Monte Casino, likewise in Kentucky, one has a reminder of the famous monastery vintages of old Europe in that this place makes practically the major portion of the wine employed by the Roman Catholic Church in America for sacerdotal purposes.

9. In the North shippers and business men generally find great interest in visiting the docks of New York. What similar features has the South to offer?

The Cotton Levee at New Orleans is one of the sights of the world. December is usually the banner month for arrivals, and then from seventeen to twenty thousand bales may be seen by the eye at one sweep. There have been days when one railway brought in eighteen thousand bales of cotton. The bales average roughly five hundred and twenty pounds a piece, at an average value of perhaps eleven cents the pound. What this represents in labor can be but feebly surmised. The negro pickers are paid by weight, some of them earning from two to two dollars and a half a day.

10. Every one has visited the Stock Exchange of New York, the heart of the business of the North. What does the Cotton Exchange, its equivalent in the South, look like?

The Cotton Exchange at New Orleans is a small building. Visitors enter a great hall lined with blackboards,—covered with quotations,—and crowded with men, mostly tall men. One-half this chamber is for members only and is screened off by a brass railing. There is a little fountain in a deep basin and about this certain men, mounted on tall chairs, call their bids at one another. Simple as is the picture, its import can not be overestimated in dollars and cents.

11. What is the "silver bean" I have so often read of in southern stories?

In connection with the Mardi-Gras festivities of New Orleans, quite a number of the fashionable clubs have a custom of placing a bean of purest silver in the cake *de résistance* served at their fête. The person receiving the bean becomes, in a sense, the guest of honor of the evening. According to the original southern custom, however, and this still applies in many social organizations, this person must next entertain the club. He or she then again hides the bean in the cake, and so it provides a sequence of entertainments for members throughout the season.

12. What are some of the picturesque superstitions of our country?

On the "Wishing Mountain" in Tennessee the Indian girls were fond of wandering to make their desires as to lovers known to the Great Spirit. In St. Roche's Cemetery, at New Orleans, the Creole girls come in spare moments to hunt four-leafed clovers with red hearts, and then pray for good husbands.

13. In Paris every one visits Père le Chaise and the Catacombs. Have we any similar cemeteries in our country?

In New Orleans, owing to the dampness of the alluvial soil, the very poor alone are buried in the ground. Others are placed in vaults, usually holding four or more. In Peru similar vaults are used.

14. In Europe people make a point of visiting the famous and odd restaurants. Where have we such a one so well known as to be beyond advertisement?

Madame Beguè, who died in 1907, conducted in New Orleans a typical little French café which was world-famous for its eleven-o'clock breakfasts. One could not hurry her, and if you came for a meal you must stay to the end. The breakfast, by courses, was, for a typical day, as follows: (1) Crawfish. (2) Omelette *aux fine* herbs. Celery and radishes. (3) Tripe. Red wine. (4) Fried chicken. Fried potatoes. (5) Fried tomatoes, with parsley. Beefsteak. Cress. (6) Roquefort and Swiss cheese. (7) Apples. (8) *Café noir* with brandy. The price of the meal was one dollar.

15. What two Presidents each have two graves?

Grant and Jefferson Davis. When President Grant died it was thought he would be interred in the family lot in Spring Grove Cemetery, near Cincinnati. Hasty friends, therefore, directed the stone-cutter to place the epitaph on the monument, and there it is to this day. The President, meanwhile, reposes in a handsome tomb in New York.

Jefferson Davis, for a short time after his death, was interred in a vault

beneath the great column in one of New Orleans' famous burying grounds. Later his body was removed to Richmond, Va., but the epitaph on the slab likewise remains, and few guides stop to tell strangers other than that the President of the Confederacy is interred there.

16. Where can an American, *in* America, enjoy typical foreign plays given in a foreign manner?

A number of the larger cities, notably New York and Cincinnati, have successful German theatre troupes playing their dramas in the native tongue. In New Orleans the French Opera House is carried out after the Parisian style, even to the three knocks of the stage director before the rising of the curtain. In San Francisco a very successful Chinese theatre was one of the famous sights before the earthquake of 1906.

17. Just what is a bayou?

A bayou is a deep, dark creek flowing sluggishly through swampy land, bordered by flag and reed-covered *savannas,* and usually heavily lichened timber.

18. What is the "picanniny's candy" in the South?

The sugar cane. The cane is peeled quickly with a penknife, and then broken up into sections. Strangely enough, the cane can not be bitten across on the diameter; it is far too tough for this, though yielding to the teeth readily in the lateral direction. It leaves a very sweet taste as one chews it.

19. What is the condition of the vegetation in the South in winter?

Most persons have an idea that the South is like the southwest in that flowers and herbage abound all the year. As a matter of fact, in the winter months the real South is as bare and desolate as is any other part of the Union, except that, saving for rare intervals, there is no snow on the ground, and the air is considerably milder. A cotton field, however, in January is bare and black, the stalks standing out leafless and empty, except for an occasional boll overlooked by the picker.

THE COST OF RECLAIMING ARID LANDS.—The great projects for reclaiming arid lands in the United States, already approved, are estimated to cost $57,046,000 and will furnish water for irrigating 1,587,000 acres at an average cost of less than $40.00 per acre.

EDITORIAL

GEOGRAPHY IN SECONDARY SCHOOLS

The Editor of the JOURNAL invites a discussion of the question of geography for secondary schools primarily from the standpoint of the necessary training for a pupil who is not intending to go to college, although the question of college entrance geography should not be omitted. The Editor has several times voiced his opinion that secondary school geography in this country is fundamentally wrong wherever it is merely or largely a study of physical geography from an advanced standpoint.

Lengthy, informal discussion, among a large group of geographers and geography teachers at the recent meeting of the Association of American Geographers at Chicago, shows a widespread conviction that the matter of secondary school geography needs a serious reconsideration. Valuable as physical geography is for certain purposes, it seems to be generally agreed that physical geography is not the sole or the most valuable phase of geography for many, if not most, secondary schools.

There seems to be a need for some form of regional geography given definitely from a physical basis, or for a modified course in physical geography with less emphasis on the classification of land forms and more attention to the geography of regions "culminating in the interaction of man with his terrestrial environment." Commercial geography is also a valuable subject for secondary schools. All really interested in the problem are invited to send their views to the Editor that the problem may receive free and frank discussion in these columns. Secondary school geography for the many is more important than for the few. Let us unite in gaining a census of opinions from geographers and teachers of geography, as well as from educational leaders, as to what is needed to make secondary geography valuable, disciplinary, usable and practical, particularly in training youths for life outside of educational institutions.

The next number of the JOURNAL will be devoted largely to the question of secondary school geography with a view to giving publicity to the opinions of all who are really interested in the question of what high school geography should be. A series of answers to a number of questions recently asked by the Editor, will, it is hoped, form the basis for a later open discussion of the question.

NOTES

THE FIELD OF COMMERCIAL GEOGRAPHY.—Modern economic and commercial geography are really the same as what was formerly termed the geography of trade. The character and problems of modern commercial geography are shortly as follows:

Commercial geography must have its source in the knowledge of situation and of orographical and hydrographical conditions, and, with the inclusion of important chapters on climatology, geology, political economy, and political geography must arrive at a thorough understanding of the conditions of production and commerce both in separate regions and in the commercial world as a whole. More shortly stated commercial geography must regard the earth as the seat of human production and commercial life.

Commercial geography presupposes the knowledge of "general geography," that is to say, the corresponding chapters of mathematical and physical geography. Commercial geography is not satisfied with knowing where the granaries of the separate countries and continents lie, but must ask for the reason, must inquire as to the situation in latitude and altitude, as to climate, water supply, and the composition of the soil. Thus commercial geography must take into account the fact that the growth of cultivated plants, whose value, as every one knows, is raised by increased demand, is quite different in mountainous situations, on low-lying ground, on marsh, moor, and alluvial soil.

The commercial geographer must, moreover, be familiar with the various degrees of decomposition of the different kinds of rock. Very important is the determination of the extent of loess over the whole area of the earth on which agriculture actually is or may be pursued. Thus, in China, for example, agriculture is co-extensive with the deposits of loess, which, owing to its yielding nature, is perhaps a hindrance to traffic, but for the economy of the Chinese people is of very great significance. Some steppes have a soil distinguished by containing much humus in the upper, but possessing the character of loess in the deeper layers. The best known is the black soil, chernozyom, in Middle and Southern Russia, on the Ob, and in the United States. A similar formation is the black soil, called regur or cotton-soil, covering a third part of southern India.

Besides the knowledge of the soil the knowledge of orography or morphology of the earth's surface is important for commercial geography. The inclination of the ground to the horizon, and the relation of that angle

to cultivation and isolation, have to be considered under the head of agriculture. The importance of these phenomena is most apparent in the case of the larger mountain chains. On the northern slopes winter is longer, and consequently the period of vegetation shorter; winter-sown crops do not succeed well if at all, and in many cases the cultivation of some plants is altogether excluded. The southern slopes are often exposed to the process of freezing and thawing, so that winter-sown seeds are very apt to perish. In many parts of Switzerland and Scotland it has been observed that crops thrive better on the northern than on the southern side in spite of the ripening being six or eight days later.

The climate of the country is just as decisive as the soil concerning the to be or not to be of certain species of plants. George Chisholm rightly says: "In the case of cultivated products, soil and climate are considerations of first importance in determining the variety obtaining at different places." Every plant demands a certain minimum of warmth and moisture if it is to flourish. The polar limits of plants are determined chiefly by temperature; but the rainfall also is often an important factor in determining the distribution in latitude. If the weather conditions remained the same year after year, the same isotherms and isohyets would limit the distribution of species of plants. Experience, however, shows that the facts are quite otherwise. Existing observations show rather that neither the mean temperature nor the mean rainfall has so great an influence on plant growth as the variations of both phenomena. Thus, for example, the variations in the climate of Europe have important effects on the yield of the crops and the price of corn in our continent.

How far industry and commerce are dependent on climate I will not further explain.

Commercial geography is much enriched by anthropogeography in the inquiries respecting traffic. Anthropogeography enables us to understand the degree in which at different times and under different circumstances the means of communication have facilitated the movements of entire peoples, and have thus caused an acceleration of the course of history. The means of conveyance among civilized peoples are essentially different from those of primitive peoples. They know only the path, whereas civilized peoples have accelerated the movement both of goods and persons by the construction of roads and by advances in the mechanical arts generally. These considerations lead to the knowledge of the fact that traffic and historical movements go on at the same time, or that the one prepares the way for the other, as, for example, the business intercourse of Russian merchants with Siberia went in advance of the extension of Russian sway over northern

Asia, and business relations between British merchants and the peoples of India and Africa preceded the acquisition of colonial possessions on the part of Great Britain in those regions.

Anthropogeography leads commercial geography to discussions about the relation of the zone of intercourse to the "Oecumene," the inhabited earth, the quality of roads, the means of bridging over the gaps between different areas of human settlement, roads as a standard of civilization, as instruments of war, traffic as a preliminary condition of the growth of states All this is of the greatest importance in commercial geography,—and opens out quite new perspectives, and leads to a deeper comprehension of terrestrial problems.

Traffic is the movement or conveyance of persons, animals, or things towards definite points. According as one considers place, movement, or object moved, three large groups in the mode of intercourse can be distinguished. Considering place, I distinguish intercourse by footpath, mule (or other animal) track, road, railway, river, lake, coast, and over-sea traffic. Considering the nature of the movement one may distinguish walking, running, carrying, the employment of animals for riding or draught, and as beasts of burden, among which may be included flying animals as carrier pigeons, and the employment of sledges, ships, carriages, balloons, and wires with the aid of various mechanical contrivances and dynamical agents. Finally, considering the object moved one distinguishes traffic in persons, commodities, and news. In a general sense one also distinguishes intercourse by land, water and air.

It is an important task of commercial geography to determine the regional distribution of the different kinds of road and means of transport. The roads of commerce are not only a means of civilization, they are also a measure of the degree of civilization, and it is especially by the improvement in the means of transport that during the last hundred years commerce has attained a development both in content and extent with which that of antiquity can scarcely be compared, even when we consider the roads of the Roman and of the Chinese and the cemented roads of the Incas on the inner highlands of the Andes.

The highway of world commerce, so far as one may speak of it at all with reference to ancient times, has totally changed its character. Even to-day the roads of the interior of Brazil, of Africa, and of Asia (caravan routes) are nothing else than a certain kind of marked stages (itineraries).

The great pioneer in road (including railroad) making has been Great Britain, but the importance of commercial roads is now well appreciated and exactly known by other states, amongst which we may single out

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Russia. It is only by the abundance of the means of communication that that colossal and clumsy giant, chained at hands and feet, has become free and flexible. And it is just this fact which gives us a sufficient explanation of the almost feverish haste in the construction of railways in eastern Siberia and towards the frontiers of Persia and Afghanistan.

Strictly speaking, a world-trade did not exist till the most recent times, till the Pacific became a link in the world's commercial highways.

The network of commerce has often been compared with the vessels that serve for the circulation of the blood in the human body. Just as this is effected by a number of larger and smaller veins and arteries that ramify through the body, so the world-trade is carried on in main-lines and by-roads the density of which depends on the direction and slope of the mountains, on the course of the rivers, on the climate and on the fertility of the soil caused by the latter and by the general situation, on the natural products, and on the character of the confines both political and natural. In order to estimate the density of traffic in a certain territory it is less important to know the total length of the arteries of commerce than the ratio of that length to the area. It is even of greater interest to calculate the ratio of that length to a given number of inhabitants, say 10,000.

—*From Scottish Geographical Magazine,* November, 1907.

PRIMITIVE CIVILIZATION AND THE TROPICS.—There are reasons for thinking that primitive, pre-civilized man, in his earliest stages, when most helpless, was an inhabitant of the tropics; that he lived under the mild, uniform, genial climate of that zone, where food was easily obtained and protection against the inclemencies of the weather least necessary. There has been a feeling that southern Asia, bordering on the Indian Ocean, with its numerous bays, was probably the cradle of humanity. Civilized man is believed by many to have appeared first on the delta formed at the head of the Persian Gulf by the Tigris and Euphrates Rivers, where also wheat was very likely first grown. Ancient civilizations seem to have developed in the drier portions of the tropics, where irrigation was necessary in order to insure abundant and regular crops, and where lived races more energetic and more hardy than those of the damper and rainier portions of the tropics, with more luxuriant vegetation. As Professor Hilgard* has well said: "It is hardly doubtful that the ancient 'Kulturvölker' recognized these advantages (of irrigated lands) by experience, and eschewed the laborious task of rendering cultivable the comparatively infertile, or, at

* E. W. Hilgard: "The Causes of the Development of Ancient Civilizations in Arid Countries: *No. Amer.*, Vol. 175, 1902, p. 314.

least, readily exhausted, lands of the forest regions..... And it is also clear that, inasmuch as the establishment and maintenance of irrigation canals necessarily involve co-operation, and therefore a rather high degree of social organization, the conditions of the arid regions were exceptionally conducive to the establishment of the highly complex polities of which the vestiges are now being unearthed in what we are in the habit of calling deserts." Civilization was thus probably first developed, not where the overwhelming superabundance of nature's gifts seems to offer the best conditions, but where man was under some stress of labor, some spur to effort, in less favorable natural conditions, but such as developed him. Within the tropic, the greatest progress later came, not on the damp lowlands, but on the less fertile plateaus of Mexico and of Peru, where the Aztecs and Incas made their marvellous progress in the drier, cooler and more rigorous climates of altitudes of over 7,000 or 8,000 feet above sea-level. Ratzel has pointed out, in the case of the ruins found on the lowlands of Yucatan and of Farther India, that when such building operations are carried through by the autocratic rule over a subject class the situation is very different from that in which we see spontaneous action on the part of a whole people.

The nations living in ease on the tropical lowlands were naturally, from early days, the object of frequent attacks and invasions at the hands of the more active and more warlike races living in more rigorous climates farther north, or at great altitudes on mountains or plateaus. The invading tribes, having in time become enervated by an easy existence on the warm lowlands, have themselves often been later overcome by a new enemy from the north. Some of the greatest migratory movements in history have taken place from colder to warmer climates, as part of this general equatorward tendency in both temperate and tropical zones. The barbarous tribes broke through the northern passes and descended on the more genial and more fruitful lowlands of India, being helped to do this by the ease of the descent. Such mountain systems as the Himalayas, or the Alps, stretching east and west, are natural climatic divides between more genial and more severe climates and have often been crossed by invading armies from the north. The descent of the Aryans into India; the Manchurian conquest of China; the invasions of Greece and Italy from the north; the southward movement of Toltecs and Aztecs in Mexico, have been cited as illustrations of this equatorward tendency. In the Southern Hemisphere it has been suggested that the Kaffirs have shown the same tendency, there northward, as did the native Patagonians in their predatory expeditions to the north. The equatorward tendency may be seen to-day in the ex-

tension of European "spheres of influence," especially in Africa, the object now being essentially a mercenary one, and not a seeking for new homes in a more genial climate.—*From Some Problems of the Tropics by R. DeC. Ward in Bulletin of the American Geographical Society, January, 1908.*

THE DEVELOPMENT OF THE TROPICS.—Within the tropics, under the equatorial sun, and where there is abundance of moisture, animal and plant life reach their fullest development. Here are the lands which are the most valuable to the white man because of the wealth of their products. Here are the tropical "spheres of influence" or "colonies" which are among his most coveted possessions. It is in this belt that food is provided for man throughout the year without labor on his part; in which frost and drought need not be feared; where shelter and clothing are so easily provided and often so unnecessary, that life becomes too easy. Nature does too much: there is little left for man to do. The simplicity of life so far as providing food is concerned has been emphasized by many writers. We are told that three bread-fruit trees furnish enough food for one man; that a laborer needs only twelve bananas for his daily food; that one day a week is enough time to spend in caring for a manioc plantation; that two days' work a week is often enough to enable a man to support a family; that a month's labor will provide for a Malay more sago than he can use in a year, etc. Stories are told of shipwrecked seamen in the tropical Pacific, who lived for many days on one cocoanut a day for each man. Capt. Cook put the case very emphatically when he said that a South Sea Islander who plants ten bread-fruit trees does as much towards providing food for his family as does a man in northern Europe who works throughout the year.

In a debilitating and enervating climate, without the necessity of work, the will to develop both the man who inhabits the tropics and also the resources of the tropics is generally lacking. Voluntary progress toward a higher civilization is not reasonably to be expected. The tropics must be developed under other auspices than their own: "Where nature lavishes food and winks at the neglect of clothing and shelter, their ignorance, superstition, physical prowness and sexual passion have an equal chance with intelligence, foresight, thought and self-control."* There is no superfluous energy for the higher things of life. Thus it has come about that the natives of the tropics have the general reputation of being indolent, and unreliable; of always being ready to put off until "to-morrow." Obviously, no such sweeping generalization is to be taken too literally, for

* John R. Commons, *The Chautauquan*, May, 1904, p. 222.

the lower latitudes have produced many examples of the other kind, of men far from deficient in physical and intellectual powers, and in those parts of the tropics where natural conditions are more severe, the natives are usually more industrious. But it is true that the energetic and enterprising races of the world have not developed under the easy conditions of life in the tropics. As Edward Whymper's Swiss guide said of the natives of Ecuador, "it would be good for tropical peoples to have a winter." Guyot has put the case in this way: "A nature too rich, too prodigal of her gifts, does not compel man to snatch from her his daily bread by his daily toil. A regular climate, the absence of a dormant season, render forethought of little use to him. Nothing invites him to that struggle of intelligence against nature which raises the forces of man to so high a pitch, but which would seem here to be hopeless. Thus he never dreams of resisting this all-powerful physical nature; he is conquered by her; he submits to the yoke, and becomes again the animal man,—forgetful of his high moral destination." The movements of the body; the habit of carrying loads on the head; even the native dances, have been thought by some to show the enervating effects of the climate. One writer has even gone so far as to see similar effects in the domestic animals, which he believes to be more docile than those in extra-tropical latitudes.—*From Some Problems of the Tropics by R. DeC. Ward,* in *Bulletin of American Geographical Society, January, 1908.*

FORESTS AND STREAMS.—The regulation of streams by storage reservoirs is really an imitation of what nature is able to accomplish by the forests. Forests at the sources of the streams are veritable storage reservoirs, and without them no artificial remedy can be either adequate or permanent. Erosion destroys reservoirs, and must be controlled if reservoirs are to succeed. This can be done only by conserving or restoring the forests. The forest cover alone can reduce the amount of sediment carried by water, and make possible the permanent improvement of inland waterways. To check erosion by reforestation, work must begin in the highlands, because there the slopes are steepest, the rainfall greatest, and the action of frost most considerable, and therefore the process of erosion is most rapid and the results most destructive.

Both wide experience and scientific investigation have shown that there are two functions exercised by the forest in relation to stream-flow.

1. Its tendency to reduce the difference between high and low water, an influence which is of most importance in the distribution of flood crests, and in maintaining a steady flow of water during the different seasons of the year and during cycles of dry and wet years.

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2. Its value as a surface protection against soil erosion, thus reducing the solid burden of storm waters, and decreasing the deposits of sand and silt, which are the causes of shallow and changing channels.

These two functions follow from the very nature of the forest as a soil cover. The roots of trees penetrate through the soil to the underlying rock, where they fix themselves in the crevices, and in this way hold in place the loose soil and prevent slipping and washing. The crowns of the trees break the force of the rain and also protect the soil from being carried away to the lower valleys during heavy storms. The leaves and the branches allow the rain to reach the ground but gradually; after a rain, water continues to drip from the crown for several hours, and the soil is thus enabled to absorb the greater part of it. Screened from the rays of the sun and covered with a surface mulch of fallen leaves and humus, the soil remains loose and granular in structure and is therefore capable of imbibing and retaining water with sponge-like capacity. It is strewn with fallen leaves, branches, and trunks, and traversed by a network of dead and live roots which impede the superficial run-off of water after heavy storms. This retardation of the superficial run-off allows more of it to sink into the ground through the many channels left in the soil by decayed roots. Surface run-off of rain water is wasteful and destructive, and unless artificially controlled serves as a rule no useful purpose and may inflict great loss. Sub-surface drainage makes the best use of the total precipitation that reaches the ground. It serves both for the sustenance of plant life and for the flow of streams. Accordingly the agency of the forest cover in increasing the seepage run-off at the expense of the surface run-off is the most important function which the forest performs in relation to water supply.

A common conception of the effect of forest destruction upon climate is that it reduces the amount of rainfall. Because springs become dry and streams shrink in a deforested region, it is assumed that less rain must fall. Whether or not there be any truth in this assumption (I believe there is), it is certain that the main cause of the observed facts is the profound effect which forest destruction has upon the course which the water takes after it reaches the ground. The greatest influence of the forest is not upon the amount of rain which falls, but on what becomes of the rain after it falls. The water that sinks into the ground passes for greatly varying distances beneath the surface before reappearing, and is thus drawn off gradually from the forested watershed and supplies the brooks with pure water relatively free from detritus.

How active a part is played by the forest in regulating the run-off is

clearly shown by actual measurements of the flow of streams which drain forested and unforested watersheds. A typical illustration of streams from barren, treeless watersheds, may be found in the flow of Queen Creek, in Arizona. This stream discharges only in violent freshets, recurring usually as great flood-waves which subside almost as soon as they arise. The area of the drainage basin is 143 square miles, of which 61 per cent. is above an elevation of 3,000 feet. The rainfall is estimated to be about 15 inches. The maximum flood discharge of Queen Creek in 1896 was 9,000 cubic feet per second, and the mean discharge was 15 cubic feet per second; during a large portion of the year the stream was entirely dry.

A careful study of the behavior of the streamflow on several small timbered and non-timbered catchment areas in the San Bernardino Mountains of Southern California, made by Professor Toumey for the Forest Service in 1902, brought out in a most convincing manner the effect of the forest in decreasing surface run-off and sustaining the flow of mountain streams. Three timbered drainage areas were studied. These gave during December—a month of unusually heavy precipitation—a run-off of but 5 per cent of the heavy rainfall for that month; during the following months of January, February and March, they gave a run-off of approximately 37 per cent. of the total precipitation, and three months after the close of the rainy season still supported a well-sustained streamflow. At the same time, the similar and neighboring non-timbered catchment area under observation gave during December a run-off of 40 per cent. of the rainfall, and during the three following months a run-off of 95 per cent. In April the run-off was less than one-third of that from each of the forested catchment areas, and in June the stream from the non-forested area was dry.

Streams flowing from barren, treeless watersheds, carry an amount of gravel, sand and soil which is simply enormous compared to the amount in streams from timbered areas. Thus the United States Geological Survey determined the amount of silt carried by the Gila River at the Buttes, a stream whose basin and regimen is similar to that of Queen Creek, of Arizona, to be 10 per cent. of the volume wet or 2 per cent. of solids. To appreciate these figures it must be remembered that one-fourth of one per cent. of solid burden in the stream is enough to make the water turbid.

As long as the ground is protected by a natural covering of forest growth, rainfall has very little erosive action. It is only after the ground is laid bare by the removal of the forest that the erosion of the soil attains dangerous proportions.

There has, of course, always been, even when the natural forests were

unimpaired, some erosion, especially in the watersheds of streams in the Southeast and Southwest, but not to the extent which now obtains, and the present erosion is not only excessive, but is yearly increasing. It is the price, and in a large measure the product, of necessary agricultural and industrial development under defective methods of work. According to studies of Humphreys and Abbott the wearing down of the earth's surface over a region such as the Mississippi Valley is something like one foot in five thousand years, independent of human action. At such a rate of erosion the amount of sediment carried by the Mississippi River before the dawn of civilization could not be more than 70,000,000 tons per year. According to Professor Shaler the wearing down of the Mississippi Valley under complete tillage will be about the same as that of the Valley of the Po in northern Italy, or one foot in one thousand years. At such a rate of erosion, the solid burden of the Mississippi River should be 350,000,000 tons. But the amount of solid matter carried every year by the Mississippi River was estimated several years ago to be 400,000,000 tons. In other words, the erosion had then reached, if not exceeded, that of the Po Valley. It is greater now. The formation of soil through underground decay of the rocks cannot keep pace with such a rate of erosion. Unless measures are taken to check it the fertile layer of soil must gradually disappear, as has happened already over large areas in the Old World from precisely similar causes.

The ruinous effects of the destruction of mountain forests upon the navigability of streams and the cultural results of human labor have long been felt by most European countries and attempts have been made to remedy them. France in particular has learned by bitter experience how terribly the lowlands suffer when the mountains lose their forest cover, and has now proved by practical demonstrations that the losses produced by forest destruction can be repaired only by reforestation.

During the French Revolution of 1789, extensive clearings were made in the forests of the Provencal Alps. The French Government early recognized the danger which such bare areas threatened to property and industry, and emphasized the importance of reforestation. In 1842 the classical investigations by Surell made it evident that forest clearing was responsible for most of the damage caused by mountain torrents, and that in reforestation lay the remedy. Laws were enacted in 1860 and 1864 which recognized that reforestation, to improve streamflow, to restore the soil, and to regulate torrents was of public utility, and therefore, that it was a duty of the government. Two methods were adopted to carry out the work. Government assistance for reforestation voluntarily under-

taken by communities or private individuals; and compulsory reforestation by means of temporary dispossession, whereby the option was left with the owner of recovering his lands either by reimbursement of cost or by surrendering one-half the area to the government. The work was entrusted to the French Forest Service, and from 1861 to 1877, inclusive, an area of 233,590 acres of mountain land was put into forest or grass at a cost, including certain incidental expenses, of $2,900,000. At the close of the last century the fund appropriated by the French Government for protective afforestation amounted to $12,500,000 in round numbers, of which $4,900,000 went toward purchase of land and $7,600,000 was spent in improvement of streams and reforestation of their drainage basins. The work resulted in bringing under control a number of torrential streams and in reforesting about 425,000 acres of land, 58 per cent. of which belonged to the government, 25 per cent. to communities and 17 per cent. to private individuals. France has now a far-reaching plan for bringing under control about 3,000 torrential streams in the Alps, Pyrenees, Ardenees, Cevennes and the central plateaus, at a cost of $40,000,000. Of this 35 per cent. or $14,000,000 is for reforestation alone.

In Austria, attention was attracted to reforestation of watershed as a means of regulating stream flow by the great floods in the Tyrol and Kärnton. Austrian foresters enumerate over 500 torrents in the Tyrol, whose basins need reforesting, and on 100 streams the work has already begun. Similar work is being extensively carried on elsewhere among the Austrian Mountains.

In Italy the pressing need of reforesting land in the Apenines and the southern slopes of the Alps has long been urged upon the government by the people on account of the immense destruction wrought annually by the Po, which is now three times as destructive to land as it was in the past century. As a result of numerous petitions, a bill was passed in 1882, whereby waste land amounting to nearly a million acres was to be gradually reforested, involving an initial cost of $8.40 per acre beside current expenses.

The great efforts of nearly all the states of Europe to counteract the effects of indiscriminate forest clearing, efforts which involve an outlay of scores of millions of dollars, show how important the mountain forests are. They should be regarded as a sort of capital, whose function in the national economy is far higher than the income which the timber may yield.

Forests at high altitudes, at the sources of navigable streams, on shifting sands, on banks of large rivers, and on steep, exposed slopes are recog-

nized in most of the European countries as "protective forests," and are managed with the prime object of preventing washing and erosion of soil. Thus at high altitudes on steep, exposed slopes and near the timber line, clear cutting as a rule is forbidden and timber must always be cut either in narrow strips or by gradual thinning. Severe governmental regulations controlling the management of protective forests on private lands are common in Europe. There can be little doubt that similar action will be forced upon us in the United States by the results of destroying our mountain forests.—*From Relation of Forests to Stream Control.* American Waterways, The Annals of the American Academy of Political and Social Science. Vol. XXXI, No. 1.

Traffic and Vessel Tonnage on the Great Lakes.—Contrary to the general understanding this traffic consists of relatively few commodities, most of which are products of the mines, the forests and the grain fields, surrounding or lying beyond the Great Lakes. Iron ore and coal constitute the bulk of the tonnage.

The tonnage of ships and traffic passing the locks at Sault Ste. Marie gives the clearest index of the business handled on the lakes, though these figures do not include the tonnage passing between Lake Michigan and the East. Over one-third of the tonnage of ships under the American flag and half the steamers of 1,000 tons and upwards are on the Great Lakes, and last year the total tonnage of freight east and westbound passing over the Lime Kiln Crossing below Detroit, which would include the business of both Lake Michigan and Lake Superior to and from Lake Erie, amounted to over 70,000,000 tons in a season of 230 days. Over 25,000 vessels passed Detroit, an average of one ship every thirteen minutes, and 200 tons of freight per minute for the season. These figures exceed those of any navigable stream in the world. The records taken at the Sault Ste. Marie locks, indicate in a general way the character of this tonnage and the relative importance of the commodities of which it is composed. Last year the total freight through the Soo amounted to 51,751,080 tons, carried in 22,155 boats. It was valued at $540,000,000, and was divided in the proportion about 80 per cent. eastbound and about 20 per cent. westbound. The principal eastbound business was:

Iron ore, 35,357,042 tons; wheat, 84,271,358 bushels; other grain, 54,341,155 bushels; flour, 6,495,350 barrels; copper, 107,633 tons.

Westbound:

Bituminous coal, 7,728,255 tons; anthracite coal, 1,011,275 tons; general merchandise, not comparatively heavy, but of relatively large value.

The larger part of the total is iron ore and coal, and the eastbound

movement over-shadows the westbound in tonnage, and also in what is known as "bulk" freight; *i. e.,* ore, coal and grain as distinguished from package freight or general merchandise. The relation between the tonnage of the several classes of freight does not correspond with the ratios of the values. In 1905 it was estimated that of the total value of traffic through the Soo during that year, the value of the iron ore and products of iron represented 27 per cent., cereals, 28 per cent., copper, 7 per cent., coal, both anthracite and bituminous, 5 per cent., lumber, 4 per cent., and all other products 28 per cent.

The total number of vessels on the Great Lakes early in 1907, with their gross registered tonnage, was as follows:

	Number	Gross tonnage
Sailing vessels	519	269,136
Steam vessels	1,844	1,841,438
Canal boats	480	50,599
Barges	209	73,259
Total	3,052	2,234,432

Deducting the canal boats, the number of vessels actually engaged in lake traffic was 2,572, and the gross tonnage 2,183,833. The percentage of sailing vessels is decreasing year by year; most of those now running are on Lake Michigan. In 1895 sailing vessels carried 30 per cent. of the tonnage passing the Soo; in 1905 only 15 per cent. The craft on the lakes now ranges from the old boats of small size to the modern ore carriers made of steel, the latest of which are 605 feet over all, with sixty-foot beam, a depth of thirty-two feet, and a capacity of 13,000 tons. The barges referred to above are generally towed by steamers of the same line. —*From Transportation on the Great Lakes.* American Waterways, The Annals of the American Academy of Political and Social Science. Vol. XXXI, No. 1.

TRANSPORTATION.—Transportation is one of the most important questions in the commercial world, and its importance will increase with the growth of wealth and population. Quick and easy transfer and exchange of commodities between different communities is the very life of trade. The cotton grower and lumberman of the South, the grain and meat farmer and lumberman of the West, must send their bulky products to our populous middle and eastern sections and to Europe, receiving in exchange innumerable articles of manufacture, etc. Large numbers of people are constantly moving from place to place, and the mail must be carried with rapidity. The more enlightened and civilized a people becomes the more

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complex and important are their transportation problems. If all communication with the outside world were cut off from New York City for a week and no food supplies were sent in by water, rail, or earth roads, many people would starve. During the past two years the whole country has been aroused on this subject as never before. Many communities have suffered terribly because a lack of transportation facilities prevented them from moving their commodities. Congress has passed the rate bill, and many state legislatures have enacted laws intended to benefit transportation. Everybody is talking about the subject in some form. Many people think repressive legislation against the railroads will solve it, and others that a complete and thorough development of our waterways would be the panacea for all our transportation ills. None of these people are entirely right, and all have more or less right on their side. One feature of the question is admitted by all and that is its *national character. Nature recognized no state-lines in laying out her mighty waterways, and man had as little regard for them in constructing railroads.* Our waterways and railroads are interstate. They extend far beyond the confines of states and should be controlled by the nation rather than by the states. —*From Program for Improvement of American Waterways.* American Waterways, The Annals of the American Academy of Political and Social Science. Vol. XXXI, No. 1.

United States Soil Survey Reports.—Probably the majority of teachers are not aware of the large amount of geographic material that is contained in the annual reports of the Soil Survey which is an important activity of the United States Department of Agriculture. The reports are written for the general reading public and are generally stated in untechnical language. They can usually be had separately and often several copies of each regional report can be obtained if the school is located in the area covered by the report. The seventh report (1905) has much interesting material among which are the following:

The Binghamton, New York, area furnishes a contrast of fertile alluvium along the Conewango and Susquehanna Rivers and the upland soils of the dissected Allegheny Plateau. The areas located on the Piedmont show characteristic soils derived from the prevailing granites, schists, gneisses and Triassic sedimentaries which underlie that province in various parts. Piedmont areas are Chester, and Montgomery counties, Pennsylvania; Louisa County, Virginia; York County, South Carolina; Spalding County, Georgia. The Hanover, Virginia, area includes both Piedmont and Coastal Plain soils.

Coastal Plain soils, topography and drainage are described in the following reports: Yorktown, Va., Perquimans and Pasquotank, N. C., Duplin, N. C., Montgomery, Ala., which includes the famous "Black Belt," and the Houston, Lee and Lavaca areas, Texas.

Blount County, Ga., shows the soils on the low Appalachian ridges and the intervening valleys. East Baton Rouge Parish, La., has the flood plain of the Mississippi and the adjoining uplands. Madison County, Ky., has a portion of the famous Blue Grass country and the less fertile contiguous uplands. The Cleveland, Ohio, report shows the old lake beaches which are largely used for the cultivation of early vegetables. In Missouri the Crawford and Scotland areas are examples of glaciated and unglaciated regions. Sub-arid regions with their problems of irrigation and excessive "alkali" salts are described in the Grand Junction, Col., area. Nearly every state has its principal soil types described and mapped and one can usually find an area close enough to his own to give a fair description of his home area.—*F. V. E.*

ICELAND: ITS HISTORY AND INHABITANTS.—It is as rational to call this island Iceland as it is to call an ice sheet measuring several hundred thousand square miles Greenland. Iceland is not a bleak, arctic region, embedded in thick-ribbed ice, though its northmost peninsula, Rifstangi, projects about a mile north of the Arctic Circle. Situate between 63° 24′ and 66° 33′ north latitude, yet its thermic anomaly is such, owing to the Gulf Stream, that the mean temperature of the month of January at Stykkisholm, on the west coast of Iceland, is 34.5° F. higher than it should be in that latitude. It is surprising that January at Reykjavik is milder by 1½° than at Milano, North Italy, or 1° F. milder than at Munich on 48° 9′ north latitude, i. e., 3½° farther south than London (51° 33′ north latitude), while the mean annual for the same place is but 1° less than at St. Johns, 16° farther south, namely, 39.5° F., or as much as that of parts of Asia situate over 17° (over 1,000 miles) farther south. Grimsey, off North Iceland, cut in two halves by the Arctic Circle, is 5° F. warmer in January than Stockholm. The coolness of the summer, however, reduces the annual mean. The mean temperature of summer at Reykjavik is only 53° F. (July, 59.20° F.). The sea round the south, west, and east coasts of Iceland is never less than 41° F., while on the north coast the nearness of polar ice drifting down from Greenland occasionally, every four or five years, causes a fall in temperature.

It will thus be seen that Iceland has a temperate climate, while the clearness of its atmosphere rivals that of Italy. "A medium of matchless

purity" this combination of sea and mountain air has been well called, and it is most bracing and exhilarating—"like drinking champagne," an English traveler says in her book on Iceland. It is freer from microbes than the air of any part of Europe, and, according to the researches of Dr. W. L. Brown, the blood of an Icelander, does, on an average, contain more hemoglobin than that of other inhabitants of Europe.

No country on earth of equal size contains so varied and wonderful phenomena. The glaciers of Switzerland; the fiords, salmon rivers, and midnight sun of Norway; the volcanoes, grottoes, and solfataras of Italy, on a grander scale; the mineral springs of Germany; the geysers of New Zealand; the largest waterfall, next to Niagara, in the world, the Dettifoss, all are here. Nowhere has nature been so spendthrift in giving a geological lesson to man. If there be sermons in stones, volumes lie unread here. Here we see her Titanic forces at work building up a country.

Let us approach this wonderland. A high tableland, out of which rise sharp peaks and glittering ice fields, and into which run winding fiords, fringed by rocky islets on which the waves break in a white line of foam. You do not miss the forest, which is not there, for the vivid brilliance of the air shows the glacial white and volcanic black, and sunset turns them to rich purple and violet.

Iceland is a plateau region composed of older and more recent volcanic masses, not older than the Tertiary period, of an average altitude of from 1,650 to 2,000 feet, occupying thirteen-fourteenths of the island. It consists of basalt and palagonite tufa and breccia; the latter, the younger formation, in the center and toward the south, while the greater part of the west, east, and north coasts is of basalt, or nearly two-thirds of the island. The glaciers rise like broad domes from this plateau. In the south, where the glaciers come down to the sea, there are no harbors for 250 miles, from Djupivogr to Eyrarbakki, for all the fiords have been filled up with detritus brought down by the glaciers.

Iceland has another and greater claim to your interest. It is as William Morris said, the Greece of the North. It produced in the twelfth and thirteenth centuries a literature unparalleled after Rome before the golden age of England and France, in character drawing, in passionate dramatic power, in severe, noble simplicity, in grim humor. All the characters of the Sagas live and move to-day. Every hill and headland, and valley in the island is full of their presence. The Icelander of to-day knows them by heart. It is as if every Englishman, from pauper to king, knew Shakespeare's historical plays and could retell them more or less in his or her own words. It has kept the national pride alive through evil times. It has

preserved the language almost untouched by time and foreign intercourse.

Nowhere is the contrast between man and his surroundings so glaring as in Iceland. Buried in snow and darkness, deprived of every comfort, living on rancid butter and dried fish, drinking sour whey and milk, dressed like his servants, seeking in a little boat his food, yet having a cultured mind, possessing an intimate knowledge not only of the history of his own country but of Greece and Rome, a poet fond of throwing satires, intellectually and morally the equal of his European guest, considering himself your equal and refusing to be ordered about by a rich Englishman, an owner of several square miles of land and hundreds of sheep, having a pedigree going farther back than that of his visitor, a jack-of-all-trades, a blacksmith in his smithy, boat builder and carpenter, an artist in filigree work, a carver in wood, an eager reader of books. He has universal education up to the degree to which it is useful to a man. There are no schools in Iceland, yet every child at 12 can read, according to the parish statistics. In no country in Europe are so many books printed and sold, in proportion to the population. A population equal to that of Hampstead, 76,000, has 12 printing presses, the earliest being established as far back as 1530. About 100 books annually, 14 newspapers, and 8 periodicals are produced to satisfy the literary needs of this little nation.

Yet this literary people still live in a pastoral and Homeric civilization which is a modern lesson of the healthfulness of human life lived in close contact with the free, wild life of nature, such as would have delighted the heart of Rousseau or Thoreau. As a proof that this life is healthy I give the example of a clergyman who died four years ago, 113 years old, having managed to live all his days healthy and happy on 30 pounds a year, the average stipend in the Icelandic church. The sheep yield food and clothing. Their wool is pulled off in spring, carded, spun, woven in hand looms, and worn undyed. You make shoes of their skin and spoons of the horns. Every opportunity is seized for the telling of stories and reciting of poems. Only the milk ewes are kept at home in summer to be milked, the rest of the sheep are gathered in from the mountains in autumn, notice being given at church from the pulpit. These autumn gatherings, with people sitting on the walls of the stone inclosures telling stories, are quite Homeric. The winter evenings with each member of the family busy at work in the same room; the men shaving the wool off sheepskins on their knees, making ropes and nets of hair, the women using spindle and distaff, embroidering, etc., afford a still better opportunity for stories and poems.

There are even wandering minstrels who gain their livelihood by recit-

ing prose or poetry, which they know by heart, at various farmhouses till they exhaust their stock.

To conclude with a few statistics, the annual trade of Iceland is worth close on 1,000,000 pounds, export and import together. The principal articles of export are salted codfish, wool, mutton, and eiderdown. A large and increasing part of the trade is with Great Britain. In the fifteenth century all the foreign trade was in English hands. Henry VIII negotiated with Denmark in 1518 and 1535 for its transfer to England, and its economic and strategic importance to Great Britain has been set forth as late as 1835 in the *Quarterly Review* by Sir George Mackenzie and Sir William Hooker, who held that Iceland ought to be a British possession. It has been declared by experts that the fishing grounds of Iceland are richer than those of Newfoundland, and, though they are much nearer Great Britain, their annual yield is not more than 12,000,000, because they are not worked as they ought to be.

From Iceland: Its History and Inhabitants, By Herr Jon Stefansson, Ph.D. Annual report of the Smithsonian Institution, 1906.

AN APPROACH TO THE GEOGRAPHY OF THE UNITED STATES.—The first lesson of the year is generally an exercise in map reading, its object being to test the ability of each child in this direction, to extend his knowledge and use of maps, and to acquaint him particularly with the contoured sheets of the United States Geological Survey. These maps offer such splendid illustrations of the relation of man to his environment that we can ill afford to pass them by when we are trying to emphasize certain geographic relations. The points covered in this exercise are as follows: the meaning of scale and how it is expressed, the interpretation of colors and other symbols, the meaning of contour lines, the method of indicating latitude and longitude, and how to orient a map. The methods of expressing scale—1 : 40,000,000 or—$\frac{1}{63,360}$ are explained and maps of different scales are examined and compared. Questions are asked which will test the understanding of colors and other map symbols. Then we take an excursion across the river to the Palisades, armed with a compass and a contour map of the locality. The meaning of these lines is apprehended as we climb the cliff and reach the plain on top. At a convenient point on the westward slope of the Palisades we obtain a view of the Hackensack Valley and the Jersey Highlands. Here we orient the map by means of the compass, point out the large features we see, and measure the heights we have climbed and the distance we have walked. When we return to the schoolroom the map is oriented on the table and the direction of these

features again determined. We then draw our meridian line on the floor and fix the direction of well-known points such as Brooklyn Bridge, Newark, Sandy Hook, and Albany. We find the latitude and longitude of New York from the map, and its approximate latitude and longitude in Europe and South America. This gives the opportunity to review the notions already gained of the relations between latitude and length of day, and our meridian and noon-hour. Other opportunities to review connections between these facts and their relations to life are abundant. When Tom leaves the geography class and takes a trip to Mexico, the settlement of the question "To what hour do the hands of Tom's watch point at this moment?" awakens spontaneous interest; and when longitude and time are studied in the arithmetic class the value of these facts and their relations is again emphasized.

The general treatment of North America which procedes a detailed study of the United States is largely in the nature of a review. Facts and principles learned in earlier years are brought into requisition, and as the new data presented will be recalled and fixed by repetition and enlargement later, only a short time is spent on the outline just given. The topic of *climate* receives special emphasis, for an understanding of its causes and consequences is the key to a large number of problems we have to solve; besides this, no other topic affords so excellent an opportunity to collect and study facts, and to predict and search for consequences.

An example of how the chief facts about the temperatures of North America are collected is given below. The results are taken from a paper of a seventh-grade boy and are accurate enough to enable him to draw correct conclusions. Each child is provided with a map of North America, one of the United States, and temperature maps of the world showing the isotherms of January and July.

TEMPERATURES OF NORTH AMERICA

Sections	Places	January	July	Range
West Coast	Sitka	30°	60°	30°
	Vancouver	30°	60°	30°
	San Diego	52°	65°	13°
East Coast	Nain	10°	50°	40°
	Quebec	20°	60°	40°
	Charleston	50°	80°	30°
Central Plain	Port Nelson	—10°	50°	60°
	Winnipeg	10°	60°	50°
	Vicksburg	40°	80°	40°

From these data the conclusion is drawn that the western coast of North America has in its northern and central portions a warmer, more equable climate that the eastern coast, and that the central part has greater extremes than the other two. Recalling what we have learned of the climate of Europe and Asia, we find we have here a direct consequence of a general law, that the interior of a continent in the belt of westerly winds has greater extremes of climate than either coast, and that the western coast is warmer than the eastern. The causes that produce this result are then sought for and some effects of these physical forces on life conditions are suggested. Our boys and girls are always very responsive in enriching such instruction with their own observation and experiences, for many of them travel extensively and the majority read the best magazines and newspapers.

Along with this work of development go the drill exercises which help to fix important data. Outline maps are filled in with facts of climate, surface, or life; a written statement of the general law involved in each case and its application to this continent is asked for; a list is made of each vegetation region with the name of a characteristic plant or animal in each, and the locality where it may be found; a written description of life in one of these regions, with an accompanying sketch in color or pencil, is often made. In fact this kind of work is as varied as the ingenuity of the teacher and pupils makes possible; the results form excellent material for drill questions which rouse a class into an attitude of alert attention.

After this general work on North America, we proceed to detailed study of the United States.

—From Teachers College Record.